

**CLAIMS**

- 1      A monolithic micro or nano electromechanical transducer device including:
- a pair of substrates respectively mounting one or more elongate electrical  
        conductors; and
- 5      resilient solid state hinge means integral with and linking said substrates to  
        relatively locate the substrates so that respective said elongate electrical  
        conductors of the substrates are opposed at a spacing that permits a  
        detectable quantum tunnelling current between the conductors when a  
        suitable electrical potential difference is applied across the conductors;
- 10      wherein said solid state hinge means permits relative parallel translation of  
        said substrates transverse to said elongate electrical conductors.
- 2      An electromechanical transducer device according to claim 2, wherein the  
        opposed elongate electrical conductors mounted on the respective  
        substrates are substantially parallel.
- 15    3      An electromechanical transducer device according to claim 1 or 2, wherein  
        said resilient solid state hinge means is dimensioned to have a substantially  
        lower stiffness in a selected direction relative to a direction orthogonal to the  
        selected direction.
- 20    4      An electromechanical transducer device according to claim 1, 2 or 3  
        wherein said solid state hinge means comprises at least one outstanding  
        pillar or post from one of said substrates and a web integrally joining the  
        pillar to an edge region of the other substrate.
- 25    5      An electromechanical transducer device according to any preceding claim  
        wherein, for detecting linear translation, said hinge means comprises a pair  
        of said resilient solid state hinges.

- 6      An electromechanical transducer device according to claim 5, wherein said hinges include hinges webs in mutual co-planar alignment.
- 7      An electromechanical transducer device according to any one of claims 1 to 4 wherein, for detection of rotational or angular translation motion, said  
5      hinge means comprises one or more angularly spaced solid state hinges.
- 8      An electromechanical transducer device according to any one of claims 1 to 7, wherein the respective substrates are planar plates or wafers, one overlying the other.
- 9      An electromechanical transducer device according to claim 8 wherein said  
10      plates or wafers are rectangular.